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With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!



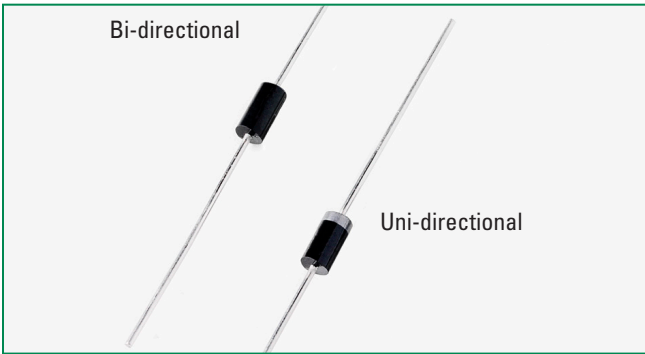
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**TP6KE Series**



**Agency Approvals**

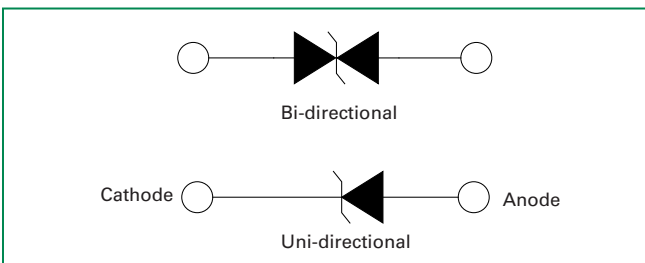
AGENCY	AGENCY FILE NUMBER
	E230531

**Maximum Ratings and Thermal Characteristics (T<sub>A</sub>=25°C unless otherwise noted)**

Parameter	Symbol	Value	Unit
Peak Pulse Power Dissipation by 10/1000µs Test Waveform (Fig.2) (Note 1)	P <sub>PPM</sub>	600	W
Steady State Power Dissipation on Infinite Heat Sink at T <sub>L</sub> =75°C (Fig. 6)	P <sub>D</sub>	5.0	W
Peak Forward Surge Current, 8.3ms Single Half Sine Wave Unidirectional Only (Note 2)	I <sub>FSM</sub>	100	A
Maximum Instantaneous Forward Voltage at 50A for Unidirectional Only	V <sub>F</sub>	3.5	V
Operating Junction and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-55 to 175	°C
Typical Thermal Resistance Junction to Lead	R <sub>WJL</sub>	20	°C/W
Typical Thermal Resistance Junction to Ambient	R <sub>WJA</sub>	75	°C/W

- Notes:**
1. Non-repetitive current pulse, per Fig. 4 and derated above T<sub>J</sub> (initial) = 25°C per Fig. 3.
  2. Measured on 8.3ms single half sine wave or equivalent square wave, duty cycle=4 per minute maximum.

**Functional Diagram**



**Description**

The TP6KE series is specifically designed to protect sensitive electronic equipment from voltage transients induced by lightning and other transient voltage events.


**Features**

- Hi reliability application and automotive grade AEC-Q101 qualified
- Glass passivated chip junction in DO-15 Package
- 600W peak pulse capability at 10/1000µs waveform, repetition rate (duty cycles):0.01%
- Fast response time: typically less than 1.0ps from 0 Volts to BV min
- Excellent clamping capability
- Typical failure mode is short from over-specified voltage or current
- Whisker test is conducted based on JEDEC JESD201A per its table 4a and 4c
- IEC-61000-4-2 ESD 30kV(Air), 30kV (Contact)
- ESD protection of data lines in accordance with IEC 61000-4-2
- EFT protection of data lines in accordance with IEC 61000-4-4
- Low incremental surge resistance
- High temperature soldering guaranteed: 260°C+5/-0°C / 10s ±1sec / 0.375"/(9.5mm) lead length, 5 lbs., (2.3kg) tension
- V<sub>BR</sub> @ T<sub>J</sub> = V<sub>BR</sub> @ 25°C x (1 + α T x (T<sub>J</sub> - 25)) (α T: Temperature Coefficient, typical value is 0.1%)
- Plastic package is flammability rated V-0 per Underwriters Laboratories
- Lead-free matte tin plated package
- Halogen free and RoHS compliant
- Pb-free E3 means 2nd level interconnect is Pbfree and the terminal finish material is tin(Sn) (IPC/JEDEC J-STD-609A.01)

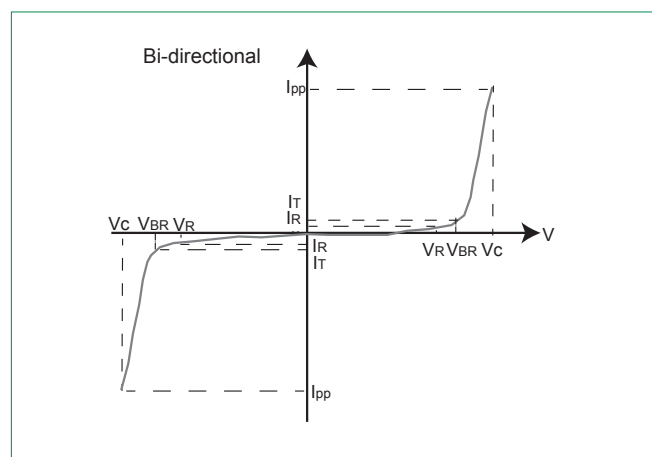
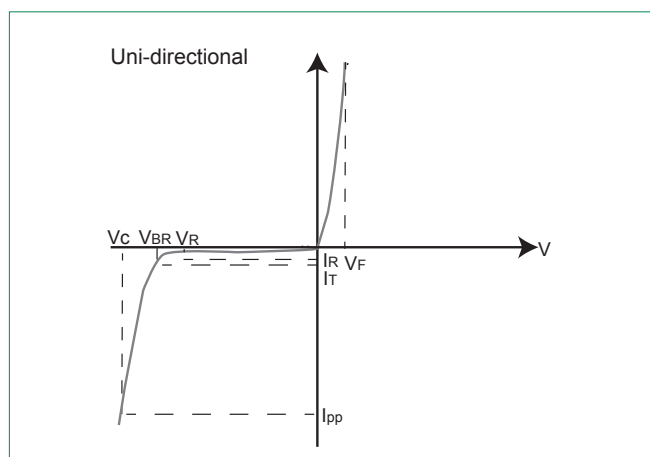
**Applications**

TVS devices are ideal for the protection of I/O interfaces, V<sub>CC</sub> bus and other vulnerable circuits used in telecom, computer, industrial and consumer electronic applications.

### Electrical Characteristics (T<sub>A</sub>=25°C unless otherwise noted)

Part Number (Uni)	Part Number (Bi)	Reverse Stand off Voltage V <sub>R</sub> (Volts)	Breakdown Voltage V <sub>BR</sub> (Volts) @ I <sub>T</sub>		Test Current I <sub>T</sub> (mA)	Maximum Clamping Voltage V <sub>C</sub> @ I <sub>pp</sub> (V)	Maximum Peak Pulse Current I <sub>pp</sub> (A)	Maximum Reverse Leakage I <sub>R</sub> @ V <sub>R</sub> (μA)	Agency Approval 
			MIN	MAX					
TP6KE13A	TP6KE13CA	11.10	12.40	13.70	1	18.2	33.5	1	X
TP6KE15A	TP6KE15CA	12.80	14.30	15.80	1	21.2	28.8	1	X
TP6KE16A	TP6KE16CA	13.60	15.20	16.80	1	22.5	27.1	1	X
TP6KE18A	TP6KE18CA	15.30	17.10	18.90	1	25.2	24.2	1	X
TP6KE20A	TP6KE20CA	17.10	19.00	21.00	1	27.7	22.0	1	X
TP6KE22A	TP6KE22CA	18.80	20.90	23.10	1	30.6	19.9	1	X
TP6KE24A	TP6KE24CA	20.50	22.80	25.20	1	33.2	18.4	1	X
TP6KE27A	TP6KE27CA	23.10	25.70	28.40	1	37.5	16.3	1	X
TP6KE30A	TP6KE30CA	25.60	28.50	31.50	1	41.4	14.7	1	X
TP6KE33A	TP6KE33CA	28.20	31.40	34.70	1	45.7	13.3	1	X
TP6KE36A	TP6KE36CA	30.80	34.20	37.80	1	49.9	12.2	1	X
TP6KE39A	TP6KE39CA	33.30	37.10	41.00	1	53.9	11.3	1	X
TP6KE43A	TP6KE43CA	36.80	40.90	45.20	1	59.3	10.3	1	X
TP6KE47A	TP6KE47CA	40.20	44.70	49.40	1	64.8	9.4	1	X
TP6KE51A	TP6KE51CA	43.60	48.50	53.60	1	70.1	8.7	1	X
TP6KE56A	TP6KE56CA	47.80	53.20	58.80	1	77.0	7.9	1	X
TP6KE62A	TP6KE62CA	53.00	58.90	65.10	1	85.0	7.2	1	X
TP6KE68A	TP6KE68CA	58.10	64.60	71.40	1	92.0	6.6	1	X
TP6KE75A	TP6KE75CA	64.10	71.30	78.80	1	103.0	5.9	1	X
TP6KE82A	TP6KE82CA	70.10	77.90	86.10	1	113.0	5.4	1	X
TP6KE91A	TP6KE91CA	77.80	86.50	95.50	1	125.0	4.9	1	X

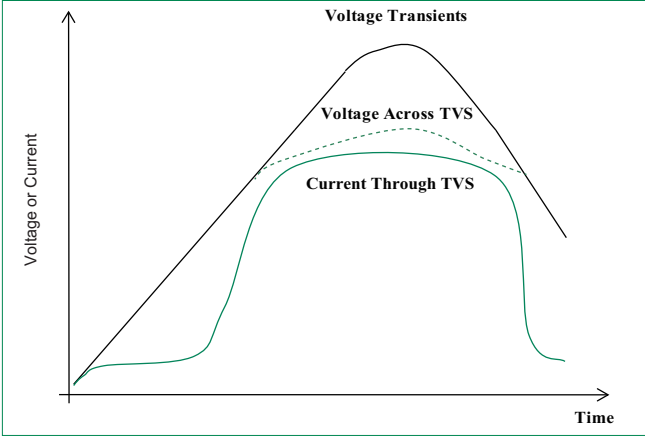
### I-V Curve Characteristics



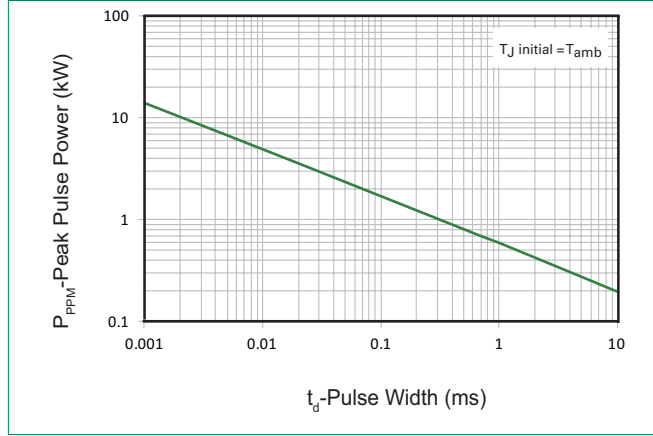
- P<sub>ppm</sub> Peak Pulse Power Dissipation** – Max power dissipation
- V<sub>R</sub> Stand-off Voltage** – Maximum voltage that can be applied to the TVS without operation
- V<sub>BR</sub> Breakdown Voltage** – Maximum voltage that flows though the TVS at a specified test current (I<sub>T</sub>)
- V<sub>C</sub> Clamping Voltage** – Peak voltage measured across the TVS at a specified I<sub>ppm</sub> (peak impulse current)
- I<sub>R</sub> Reverse Leakage Current** – Current measured at V<sub>R</sub>
- V<sub>F</sub> Forward Voltage Drop for Uni-directional**

**Ratings and Characteristic Curves** ( $T_A = 25^\circ\text{C}$  unless otherwise noted)

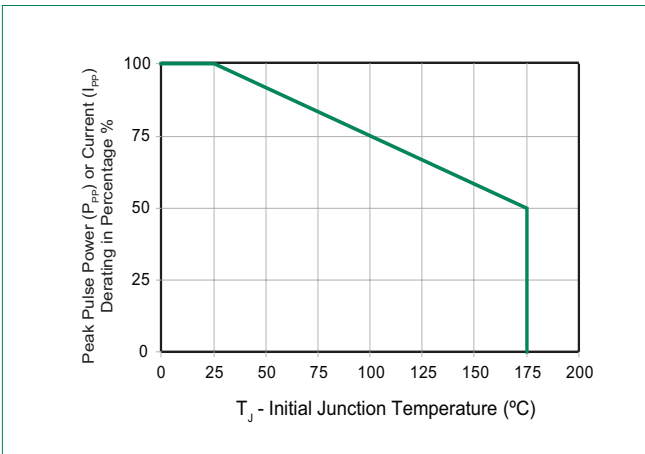
**Figure 1 - TVS Transients Clamping Waveform**



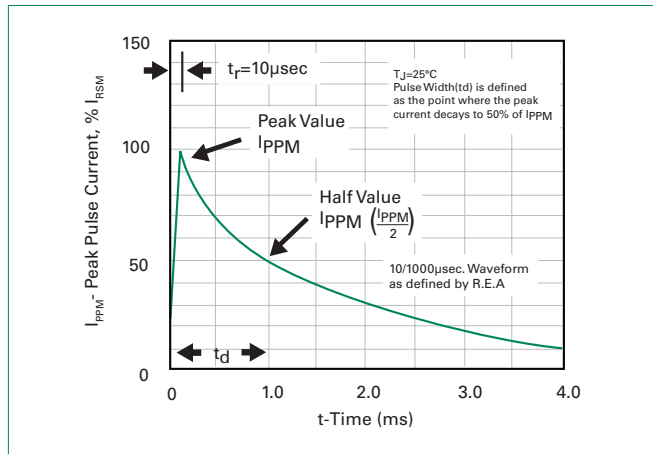
**Figure 2 - Peak Pulse Power Rating**



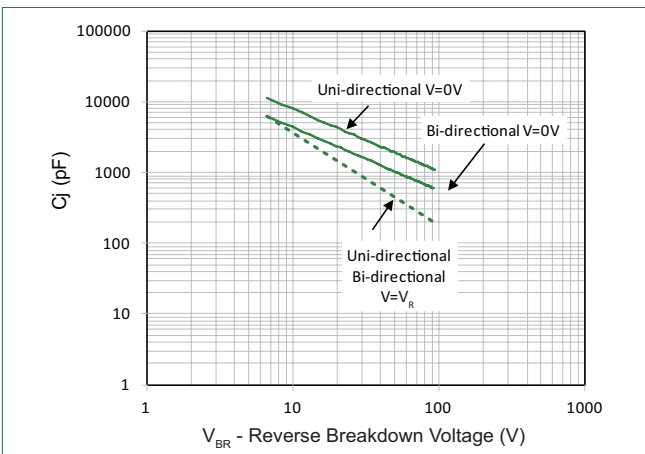
**Figure 3 - Peak Pulse Power Derating Curve**



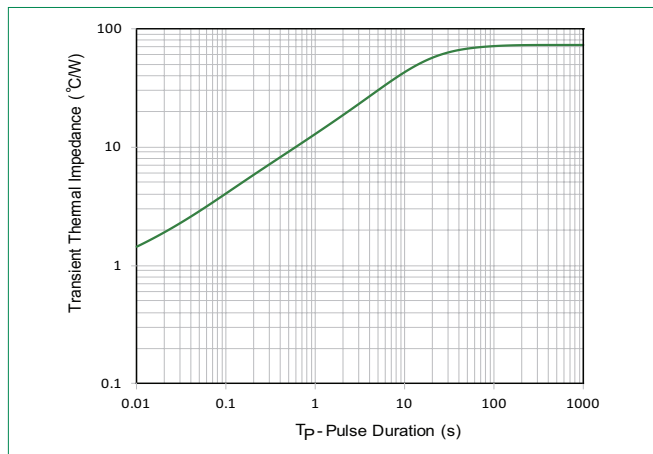
**Figure 4 - Pulse Waveform**



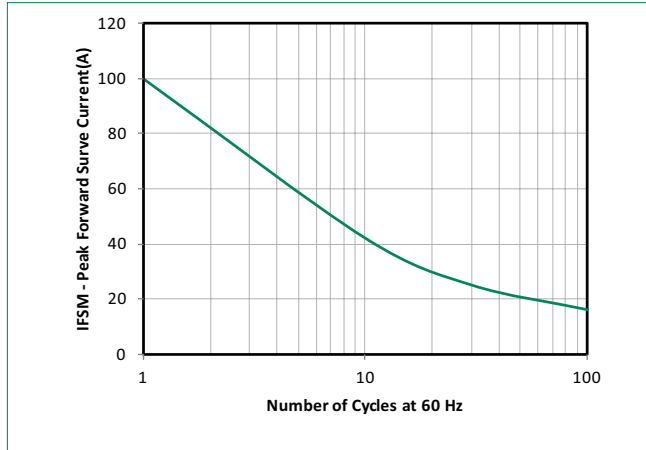
**Figure 5 - Typical Junction Capacitance**



**Figure 6 - Typical Transient Thermal Impedance**



**Figure 7 - Maximum Non-Repetitive Peak Forward Surge Current Uni-Directional Only**



### Flow/Wave Soldering (Solder Dipping)

<b>Peak Temperature :</b>	260°C+5/-0°C
<b>Dipping Time :</b>	10s ±1 seconds
<b>Soldering :</b>	1 time

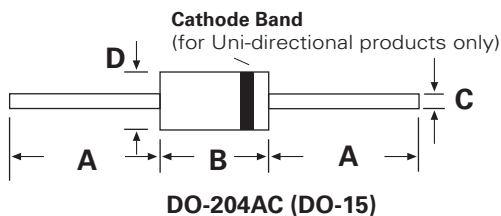
### Physical Specifications

<b>Weight</b>	0.015oz., 0.4g
<b>Case</b>	JEDEC DO-204AC (DO-15) molded plastic body over passivated junction.
<b>Polarity</b>	Color band denotes the cathode except Bipolar.
<b>Terminal</b>	Matte Tin axial leads, solderable per JESD22-B102.

### Environmental Specifications

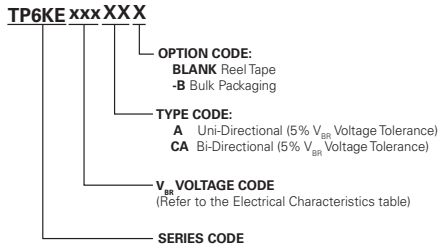
<b>High Temp. Storage</b>	JESD22-A103
<b>HTRB</b>	JESD22-A108
<b>Temperature Cycling</b>	JESD22-A104
<b>H3TRB</b>	JESD22-A101
<b>RSH</b>	JESD22-B106

### Dimensions

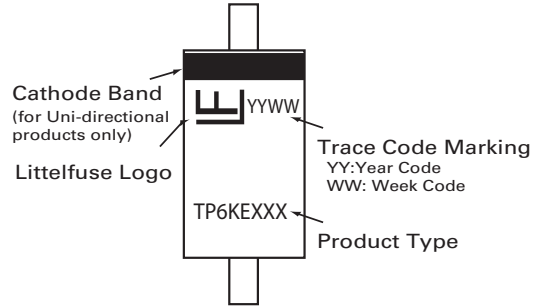


Dimensions	Inches		Millimeters	
	Min	Max	Min	Max
A	1.000	-	25.40	-
B	0.230	0.300	5.80	7.60
C	0.028	0.034	0.71	0.86
D	0.104	0.140	2.60	3.60

**Part Numbering System**



**Part Marking System**



**Packaging**

Part Number	Component Package	Quantity	Packaging Option	Packaging Specification
TP6KExxxXX	DO-204AC	4000	Tape & Reel	EIA STD RS-296
TP6KExxxXX-B	DO-204AC	1000	BULK	Littelfuse Spec.

**Tape and Reel Specification**

